

CLAIMS

1. A block polymer compound having at least three block segments, comprising:

block segments A, B and C arranged in
5 succession,

wherein the block segment C is most solvent attractive while the block segment A is most solvent repulsive; and

at least either one of said block segments has
10 an ionic group or an acidic group.

2. The block polymer compound according to claim 1, wherein at least either one of said block segments is a stimulus-responsive block segment.

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3. The block polymer compound according to claim 1, wherein said ionic group or said acidic group is at least a functional group selected from the group consisting of a carboxylic acid and a
20 carboxylic acid salt.

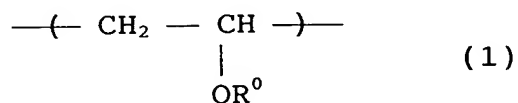
4. The block polymer compound according to claim 1, wherein said block segment C is most hydrophilic and said block segment A is most
25 hydrophobic.

5. The block polymer compound according to

claim 1, wherein said block polymer is amphiphilic.

6. The block polymer compound according to claim 1, wherein said block polymer includes a polyvinyl ether structure as a repeating unit structure.

7. The block polymer compound according to claim 3, wherein at least either one of said block segments A and C is a repeating unit represented by the following general formula (1):



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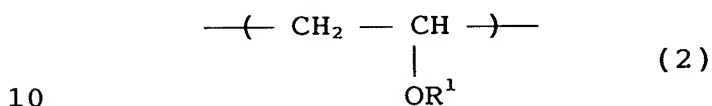
wherein R^0 represents ---X---(COOH)_r , $\text{---X---(COOR}^{10})_r$, or $\text{---X---(COO---M)}_r$; X represents a linear, branched or cyclic alkylene group with 1 to 20 carbon atoms, $\text{---(CH(R}^5)\text{---CH(R}^6)\text{---O)}_p\text{---(CH}_2\text{)}_m\text{---CH}_3\text{---}_r$, $\text{---(CH}_2\text{)}_m\text{---(O)}_n\text{---(CH}_2\text{)}_q\text{---CH}_3\text{---}_r$ or a structure in which at least one of methylene groups therein is replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an integer from 1 to 18; m represents an integer from 0 to 35, n represents 1 or 0; q represents an integer from 0 to 17; R^{10} represents an alkyl group; M represents a monovalent or polyvalent cation; and R^5 and R^6 , which may be the same or

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different, each independently represent an alkyl group.

8. The block polymer compound according to claim 1, wherein at least either one of said block segments A, B and C is a repeating unit represented by the following general formula (2):



wherein R^1 is a group selected from the group consisting of a linear, branched or cyclic alkyl group with 1 to 18 carbon atoms, -Ph, -Pyr, -Ph-Ph, -Ph-Pyr, $-(\text{CH}(R^5)-\text{CH}(R^6)-\text{O})_p-R^7$ and $-(\text{CH}_2)_m-(\text{O})_n-R^7$, in which a hydrogen atom in an aromatic ring may be replaced by a linear or branched alkyl group with 1 to 4 carbon atoms and a carbon atom in an aromatic ring may be replaced by a nitrogen atom;

p represents an integer from 1 to 18; m represents an integer from 1 to 36; n represents 0 or 1;

R^5 and R^6 each independently represent a hydrogen atom or $-\text{CH}_3$;

R^7 represents a hydrogen atom, a linear, branched or cyclic alkyl group with 1 to 18 carbon atoms, -Ph, -Pyr, -Ph-Ph, -Ph-Pyr, -CHO, $-\text{CH}_2\text{CHO}$,

-CO-CH=CH₂, -CO-C(CH₃)=CH₂, or -CH₂COOR⁸, in which, in case R⁷ is other than a hydrogen atom, a hydrogen atom bonded to a carbon atom in R⁷ may be replaced by a linear or branched alkyl group with 1 to 4 carbon atoms, -F, -Cl or -Br while a carbon atom in an aromatic ring may be replaced by a nitrogen atom; R⁸ represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; Ph represents a phenyl group; and Pyr represents a pyridyl group.

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9. A block polymer compound having at least three block segments, comprising:

block segments A, B and C arranged in succession,

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wherein at least either one of said block segments has at least one functional group selected from the group consisting of a carboxylic acid, a carboxylic acid ester and a carboxylic acid salt, connected to the main chain via two or more atoms.

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10. A block polymer compound having at least three block segments, comprising:

block segments A, B and C arranged in succession,

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wherein the block segment A is a hydrophobic block segment,

the block segment B is a nonionic hydrophilic

block segment, and

the block segment C has at least one functional group selected from the group consisting of a carboxylic acid, a carboxylic acid ester and a
5 carboxylic acid salt.

11. A polymer-containing composition comprising a block polymer compound, a solvent or a dispersion medium, and a functional material,
10 wherein said block polymer compound comprises block segments A, B and C arranged in succession, said block segment C is most solvent attractive while said block segment A is most solvent repulsive, and
15 at least either one of said block segments has an ionic group or an acidic group.

12. The polymer-containing composition according to claim 11, wherein said functional
20 material is included in said block polymer compound.

13. The polymer-containing composition according to claim 11, wherein said functional material is a colorant.
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14. A method of increasing the viscosity of a polymer-containing composition which comprises:

a block polymer compound comprising block segments A, B and C arranged in succession, a solvent or a dispersion medium, and a functional material, wherein

5 the block segment C is most solvent attractive while the block segment A is most solvent repulsive, and

at least either one of said block segments has an ionic group or an acidic group,

10 the method comprising a step of bringing said composition in contact with hydrogen ions or metal cations to increase the viscosity of said composition.

15. The viscosity increasing method according to claim 14, wherein a stimulus is given to said composition, thereby causing a phase change of said block segment B.

16. An image forming method comprising a step of applying an ink onto a recording medium to conduct recording, wherein

said ink is a polymer-containing composition including a block polymer compound comprising block segments A, B and C arranged in succession, a solvent or a dispersion medium, and a functional material,

25 the block segment C is most solvent attractive while the block segment A is most solvent repulsive,

and

at least either one of said block segments has an ionic group or an acidic group.

5 17. The image forming method according to claim 16, wherein an energy is applied to said ink to eject said ink onto said recording medium.

10 18. The image forming method according to claim 16, further comprising a step of bringing said composition in contact with hydrogen ions or metal cations to increase the viscosity of said composition.

15 19. An image forming apparatus for conducting recording by applying an ink onto a recording medium, wherein

 said ink is a polymer-containing composition including a block polymer compound comprising block segments A, B and C arranged in succession, a solvent
20 or a dispersion medium, and a functional material,

 the block segment C is most solvent attractive while the block segment A is most solvent repulsive, and

 at least either one of said block segments has
25 an ionic group or an acidic group.